Ecocycle

newsletter on life-cycle tools, management and product policy.

Winter/Spring 1997 Issue no. 5

on the inside

We all look for confirmation in our lives. Is our work meaningful? Are we good parents? And when it comes to product life-cycle management (LCM) it's the same. Will our LCM activities contribute to product improvements? Or overall environmental management within the company?

editor's column

In order to sustain LCM, we must be able to demonstrate that life-cycle activities will help improve the competitive position of the company. In government, we have to demonstrate that LCM improves the effectiveness of our programs. These issues were the topic of discussion at an International Workshop on Life-Cycle Approaches, a joint initiative of OECD and the European Commission held in Brussels last October.

The life-cycle approach is emerging as a mainstream environmental management tool

The workshop began with a number of case studies presented by European, Canadian and American consultants. The case studies, summarized in this edition of Ecocycle (see pages 2 - 6), were followed by presentations and discussions on private sector and government activities related to life-cycle management.

The workshop was well attended by industry and government representatives. Pedro Henriques, the European Commission Co-ordinator of the workshop, noted that almost all the major European industrial sectors, with the exception of tobacco, were represented at the workshop.

For life-cycle aficionados the workshop was confirmation that the life-cycle approach is emerging as a mainstream environmental management tool. As evidence of this trend, consider some of the following comments raised at the workshop.

From Industry ...

"Life-cycle assessment (LCA) is useful in identifying the best eco-efficient alternative at the pre-development phase of a product." Harald Franze, BMW

"LCA allows you to see priorities - it puts things into context." Dennis Postlewaithe, Unilever

"The return on investment in LCA studies can be 10 to 20 fold if you use good methodology and good software." Claude Fussler, Dow Europe

From Government...

LCA can support legislation, product policy and consumer information, but "LCA is not a determinant of a final decision." Germany

"[Life cycle] is a leading principle in environmental policy." The Netherlands

"LCA is needed to make the program work." United Nations Environment Programme - Cleaner Production Programme.

The workshop also raised some cautions such as the need to keep quantitative aspects of LCA separate from qualitative aspects. The point was also made that LCA does not generally question the need for the product being studied. Therefore, we must recognize that LCA and LCM do not directly address the issue of sustainable consumption.

For me, one of the most encouraging aspects of the workshop was the recognition, by many participants, of the value of adopting a life-cycle management approach. This was a refreshing

Continued on next page

LCM in Canadian industry

The use of life-cycle management (LCM) in Canada is increasing as more and more businesses are experimenting with the concept. Those who use it view it as a business tool that is market driven — one that helps them maintain relationships with customers and complements their Environmental Management Systems (EMS). These are just some of the findings of a 1996 study, commissioned by Environment Canada, based on interviews with 37 firms across Canada.

The study also identified three key reasons why firms adopt LCM approaches:

1. Tools are available and they work.

Firms use life-cycle analysis (LCA), life-cycle inventory (LCI) and life-cycle costing as well as their own tailor-made tools. For example, TransAlta Utilities developed and uses a method called Life-Cycle Value Assessment (LCVA) for employee-level business-decisions that integrates financial costs with environmental parameters. Other firms use the product life-cycle framework to support their environmental programs and facilitate customer consultations.

2. LCM adds value.

Reduced costs, increased revenue, better products, more effective marketing and improved decision making — just some of the ways LCM adds value to firms that use the approach. Some firms also use life-cycle information to further communications with government, suppliers and customers.

3. LCM provides a basic management discipline.

LCM approaches help provide benchmarks against which changes can be measured, unit processes can be improved and pollution prevention activities can be assessed. With LCM, company strengths and weaknesses become more apparent. The discipline that LCM offers is alternatively referred to as "life-cycle thinking" or the "life-cycle concept."

The study also revealed that firms with either an international focus, an established EMS and/or stewardship program, are likely to be more aware of LCM. Not all companies found value in the approach - several firms had experimented with LCA, but initial interest eventually wore off. Other firms proceeded with deeper implementation and integrated LCM into their decision-making processes.

The survey, which considered seven industrial sectors, found that LCM is being applied in many different ways. Some focus primarily on LCA in the strict sense. This change from the usual focus on traditional LCA studies that you see at life-cycle workshops.

In the words of Jan-Olaf Willums of the World Business Council on Sustainable Development, "Life-cycle is being elevated from an engineering discipline to a strategic management tool." This recognition opens the door for life-cycle management to become not only an integral part of a compny's environmental management and product design activities, but an important source of information for overall business strategy. ●

publisher's message

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Please forward questions or comments to:

Kevin Brady, Editor or Andie Paynter, Associate Editor
Environment Canada, National Office of Pollution Prevention,
Ottawa, Ontario, Canada K1A 0H3
Tel: 1-819-994-6128
Fax: 1-819-953-7970
E-mail: kbrady@pobox.com or andie.paynter@pobox.com

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Environment Canada Environnement Canada Canada

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is most evident at the industry association level where a number of database projects are under way. In individual companies, though, the use of LCM is evolutionary. In some cases it is being modified or used for operations management, often without a direct product focus. Life-cycle costing analysis on capital project decisions and assessments of vehicle environmental performance are two examples of LCM activities.

In some cases LCM changes, moves or spreads within the firms themselves. For example, where LCM is initially adopted for use in marketing (to provide information to customers), it is often then applied internally (product stewardship or EMS) and vice versa.

The government's role in this area, based on survey findings, is to: enrich the market for LCM by funding research, development, and demonstration projects; develop databases and tools; enlarge government purchasing programmes; and encourage fair reporting.

The study results suggest that the use of LCM approaches in industry will likely increase when the economic and environmental benefits are more widely understood and when the tools are more readily available and easier to use.

By: Steven B. Young,
SB Young Consulting
Tel. 1-416-562-6108
E-mail:
sbyoung@sbyoung.com

Life-cycle Management:

- ▶ is the organization of activities
- ▶ is based on information about product life-cycles
- ▶ encompasses multiple environmental and resource issues

LCM TOOLS BEING USED

Life-cycle Assessment (LCA) is a comprehensive technique for quantifying and interpreting potential environmental impacts associated with inputs and outputs to a product system.

Life-cycle Inventory (LCI) is the first quantitative stage of LCA, wherein an input-output account is determined for a product system.

Design for Environment (DFE) methods or tools assist designers in bringing environmental criteria into their product designs.

Product Stewardship is a specific tool or a banner under which companies are managing product or material systems covering flows over the full life cycle. It is also used at the industry level to indicate LCM of metals, chemicals, etc.

Life-cycle Costing encompasses two different life-cycle based economic analyses:

1. Methods to analyze and structure conventional financial costs in a life-cycle framework, extending upstream to suppliers and downstream to customers and end-of life; and
2. Techniques for economic-based costing of environmental or social externalities and adding them to traditional financial cost accounts.

Customer consultations involve varying methods to communicate product-oriented environmental information to customers. The contributions and roles of the players are placed in the greater context of the product system and the life-cycle "value-chain."

use of LCA on the rise in Europe

A recent study on life-cycle approaches in European industry, commissioned by the European Commission and the OECD, found that interest in life-cycle approaches is growing and many sectors see LCA as a tool that can foster innovation.

The study, carried out by the Science Policy Research Unit, University of Sussex, UK and Ernst & Young, UK, considered life-cycle approaches from several perspectives and focused on six manufacturing sectors: aluminum, chemicals, building materials, personal products, electronic goods and automobiles.

Benefits of LCA

Those firms using LCA cited improved competitiveness, a better understanding of environmental issues and innovation as the key benefits of LCA.

Many European firms report that waste management regulations and competition are driving LCA activity. The study also found that commodity producers (such as aluminum and chemicals) use LCA mainly to defend or promote a product and maintain static competitiveness. By contrast, complex final goods producers (such as electronics and automobiles) using LCA tend to stimulate innovation and encourage dynamic competitiveness.

Innovation, Competitiveness and Trade

Although clear examples of commercial benefits and innovation resulting from LCA were hard to find, firms from many sectors said there is real potential for LCA to drive innovation and result in long-term benefits.

The study showed that life-cycle approaches stimulate competition, result in better decisions, help firms look at environmental impacts beyond the plant gate and provide a defence against the claims of regulators, consumers and competitors.

life-cycle design at three multi-national companies

Corporate competitiveness has traditionally been achieved through new products, quality performance and cost control. Competitiveness in the 1990s and beyond will require extending these elements to include the life-cycle environmental impacts of materials and final products. Three key forces are driving this evolution.

First, government regulations are gradually moving towards life-cycle accountability and firms will increasingly face cradle-to-grave responsibility for their products and component parts.

Second, emerging international standards have life-cycle requirements. Third, environmental "preferability" has emerged as a key factor for consumers and government procurement guidelines.

These developments have fostered a growing interest in life-cycle design (LCD) — what a product contains, how it is produced, how it will perform and what will be left after its useful life.

Many firms incorporate environmental impacts as a criterion in product/process design. Since LCD is used as an internal decision-making tool, its strengths, successes and limitations remain largely undocumented. That means companies practising, or inclined to adopt LCD methods do not benefit from the experiences of others and, with few exceptions, opportunities for cross-fertilization are limited.

But that could change as a result of a study funded by the U.S. Environmental Protection Agency's Pollution Prevention Division. Tellus Institute has collaborated with 3 companies — IBM, Bristol-Myers Squibb and Armstrong World Industries — to explore a range of LCD issues and

As for LCA and trade, the researchers found little evidence of impact, but firms raised concerns that LCA could be a barrier to trade between Europe, the U.S.A. and Japan, particularly in terms of eco-labelling.

Barriers?

Despite the obvious benefits of LCA, the study identified a number of barriers that keep some firms from adopting it as a way of doing business. Uncertainty about the benefits, high cost and poor access to data are the primary barriers. Some firms are unsure about how to undertake or focus LCA studies and even less able to communicate the results.

Although a lack of standard approaches for LCA has been seen as one of the key barriers, universal standards were considered to be imprecise or inappropriate. Researchers concluded universal standards risk establishing the wrong direction for future development of LCA and may raise barriers to the use of LCA by weaker stakeholders, such as small and medium-sized enterprises, policy makers, consumers, and environmental organizations.

What about Policy?

For policy makers the challenge is in deciding what, if anything, can be done to encourage LCA, especially since the tool is immature, not formalized and already market-driven to some extent.

The study clearly showed that because the technological, market and regulatory context of industry varies by sector, LCA approaches in industry are sector-specific. The researchers, therefore, proposed that public policies in relation to industry and LCA should be sector-specific.

The findings also demonstrated that product-oriented environmental policy needs a wider network of partnerships. Instead of direct intervention, researchers recommended that LCA be promoted through facilitation and co-operation, with an emphasis on taking down the barriers and ensuring fair play between firms and sectors.

The researchers also recommended ongoing efforts to raise awareness of LCA across European industry and amongst stakeholders. Best practice programs that develop inventories, provide LCA training, and conduct pilot prjects, among other things, were suggested.

The study will be published by the European Commission this Spring.

For more information contact:
Dr Frans Berkhout,
University of Sussex
Tel: +44 1273 686 758
Fax: +44 1273 685 865
E-mail:
F.Berkhout@sussex.ac.uk

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opportunities. (A final report on this project will be available Spring 1997.)

The central objective of this project is to document, advance and disseminate information on LCD practices by asking the three firms:

1. **How is the product/process design framework expanded to include environmental criteria?**
2. **What specific tools, including life-cycle assessment, can be used to facilitate this objective and measure its progress?**
3. **What are the technological, economic, and organizational obstacles to adopting LCD practices in the company?**

Case study findings reveal that:

- current LCA methods are viewed as too data intensive and burdensome;
- companies steer away from highly prescriptive, rigid application of LCA techniques in order to maintain flexibility when considering disparate products and processes; and
- the firms recognize LCA as a valuable conceptual framework for identifying and evaluating process and product improvements and have each adapted LCA concepts using unique approaches.

How they do it...

One common theme, is that all three companies "streamline" LCA by limiting life-cycle stages (e.g., raw material extraction) and/or impact categories. Reducing the stages and impacts is one way of making LCD affordable and relevant to the firm's internal decision-making.

Each company includes its suppliers in its LCD program and two of the three companies work with their key suppliers to collect life-cycle information to inform product decisions.

For example, IBM has hired consultants to work with their principal suppliers to collect life-cycle information on materials the company uses (solvent-based paints versus powder coatings, for example). In this fashion, the company uses LCA as an overall guidance framework for choosing materials and technologies.

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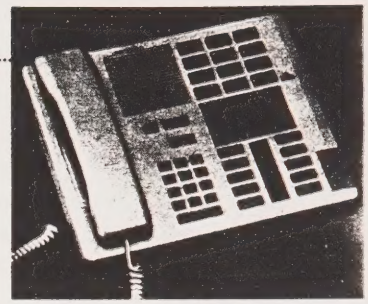
Nortel making greener phones



Nortel (Northern Telecom) and Environment Canada have embarked on a co-operative project using life-cycle assessment (LCA) techniques to identify improvement strategies in the design, manufacturing, distribution and end-of-life of a telephone.

This project will demonstrate the concept of ecodesign on a common, yet sophisticated, manufactured product. By evaluating current environmental improvement strategies, the project will help to develop long-term guidelines for product ecodesign.

The green telephone project will use life-cycle assessment (LCA) to identify the largest contributors (processes, materials or components) to the overall environmental impact of the product. It will also characterize and quantify the expected environmental benefits of alternative design, manufacturing, distribution and end-of-life changes.

The scope of the project involves: defining goals; identifying scenarios; determining environmental impacts to be considered and the resulting list of inventory items; developing the life-cycle inventory; and assessing and interpreting the life-cycle impact.

The project will follow the LCA methodological guidelines for Life-Cycle Assessment published by the Canadian Standards Association, as well as the latest documents from the International Organisation for Standardisation, ISO 14040 on LCA and ISO 14041 on Life-Cycle Inventory (LCI) and goal and scope definition.

The LCI analysis will provide information on the potential envi-

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Similarly, Armstrong World Industries, a building products manufacturer, has reached out to its key suppliers to obtain life-cycle data upstream from its operations. By contrast, Bristol-Myers Squibb has been educating its suppliers about its LCD program, encouraging, but not requiring, suppliers to undertake similar product reviews. The company has not requested suppliers to provide life-cycle information.

Most companies use a cross-functional team when undertaking an environmental review of its products. These teams may include staff from product safety, materials engineering, purchasing, research and development, marketing, manufacturing, environmental health and safety, and other areas.

Cross-functional project teams help place responsibility for improving environmental performance beyond environmental health and safety staff and put it squarely in the mainstream of all traditional business functions.

Data hurdles ...

For most companies practising LCD, data availability is a hurdle. Suppliers asked to provide data may consider the data proprietary or it may be lacking. Within the firm, environmental data collection systems are established to fulfil regulatory requirements, but these data may not be useful for LCD. So some companies fill these data gaps using qualitative information.

What was learned...

From an organizational standpoint, successfully implementing LCD practices requires support from all levels of the company, beginning with the CEO and extending to facility-level personnel. Educating employees about LCD goals and methods is critical to the program's success.

LCD is never used as a single decision tool for making product improvement decisions. Life-cycle information must also be weighed amongst other criteria, including performance, reliability, safety, and cost. While companies may be willing to incur minor cost increases from implementing environmental improvements, performance, reliability, and safety criteria cannot be compromised.

By: Karen Shapiro
Tellus Institute
Boston, Massachusetts,
United States
Tel: 1-617-266-5400
E-mail:
kshapiro@tellus.com

ronmental impacts, and will use weight, energy, cost, and environmental relevance as indicators to help determine the system boundaries. The life-cycle study will be carried out by Ecobalance Inc. of the United States in co-operation with Water Technology International.

Data will be supplied by Nortel, its suppliers, and the Ecobalance database. The data will be used to calculate inventory results using Ecobalance's LCA software model TEAM2™, both for the baseline study and the scenarios.

The inventory and impact assessment data will be carried out using indices including: natural resource depletion; ozone depletion potential; global warming potential; acidification potential; eutrophication; and solid waste.

The results of the project will include:

- a methodological report, detailing all assumptions and methodological rules;
- a data collection report, detailing the origin and characteristics of the data used;
- a conclusion report, evaluating the studied improvement scenarios;
- a public brochure; and
- demonstration telephones with selected environmental improvements.

To ensure the accuracy and credibility of the results, the life-cycle study will be subject to a peer review process. The review panel will have representatives with LCA expertise, a non-governmental representative, a telecommunications expert and an internal Nortel expert.

For more information contact:
Duncan Noble
Nortel
Business Development,
Environmental Affairs
PO Box 3511, Station C,
Ottawa, ON, Canada
K1Y 4H7
E-mail:
duncan_noble@nt.com

or:

Kevin Brady
Environment Canada
(see Publisher's Message for contact information)

Nortel – business opportunities from environmental leadership

The green telephone project is just one of many environmental initiatives for Nortel, the world's leading supplier of digital networks, with 68,000 employees, a presence in 150 countries and 1996 revenue of $US 12.85 billion.

Nortel believes that environmental leadership can help it provide superior customer value and gain a competitive advantage in the marketplace. During the past decade, Nortel has come to understand that not only is sound environmental management a "given" of the corporation's social responsibility to the global community — it also makes good business sense.

In 1991, Nortel became the first major electronics manufacturer in the world to eliminate CFC-113 solvents from its manufacturing operations worldwide. That experience taught Nortel that environmental protection, once considered by industry to be a necessary but costly activity, can save money and improve employee morale by providing a focus for individuals who want to make a difference. Environmental protection can also increase the value of Nortel's brand with current and potential customers by showing that Nortel creates environmental and business solutions.

In the mid-1990s, Nortel initiated a corporate Environmental Life-cycle program that committed it to factoring resource efficiency into all stages of the product life-cycle. That program is now helping Nortel develop a more sophisticated understanding of how environmental activities can add value to customers. Whether it be reusable packaging, elimination of hazardous materials, or more energy efficient products, Nortel works with customers to develop mutually beneficial solutions that create customer value and protect the environment.

Nortel's ground-breaking work in the area of lead-free interconnect technology is receiving considerable attention from customers who are interested in minimizing the toxicity of products and the amount of hazardous waste sent to landfill. In 1996, after years of industry-wide research, Nortel achieved a major breakthrough with the creation of the world's first lead-free telephones. At a recent meeting of Europe's major telecommunications providers, BT (British Telecom) cited Nortel's lead-free program as an example of best in-class environmental performance from telephone company suppliers.

eco-indicators
factoring environment and health into the design process

A multi-disciplinary team of scientists, industry and government representatives has developed a method for designers to include the "environmental aspects of a product in the analysis and selection of design options." The Eco-Indicator 95 method uses eco-indicators – single numbers representing the environmental impact associated with a particular material or process.

A single score is assigned to total environmental impacts.

The method uses life-cycle assessments with a weighting method that assigns a single score for the total environmental impact of the material or process under consideration. The team has calculated eco-indicator values for 100 commonly used materials and processes. These include materials such as steel, plastic, glass, etc., and processes such as transport, energy generation, treatment processes (e.g. hot galvanizing steel) and waste processing.

Environmental effects considered in the eco-indicators development include: the greenhouse effect, ozone layer depletion, acidification, eutrophication, smog and toxic substances. Toxic substances in the workplace, resource depletion and quantity of wastes produced were not considered. Because of these omissions, Eco-indicator '95 is primarily an indicator of emissions.

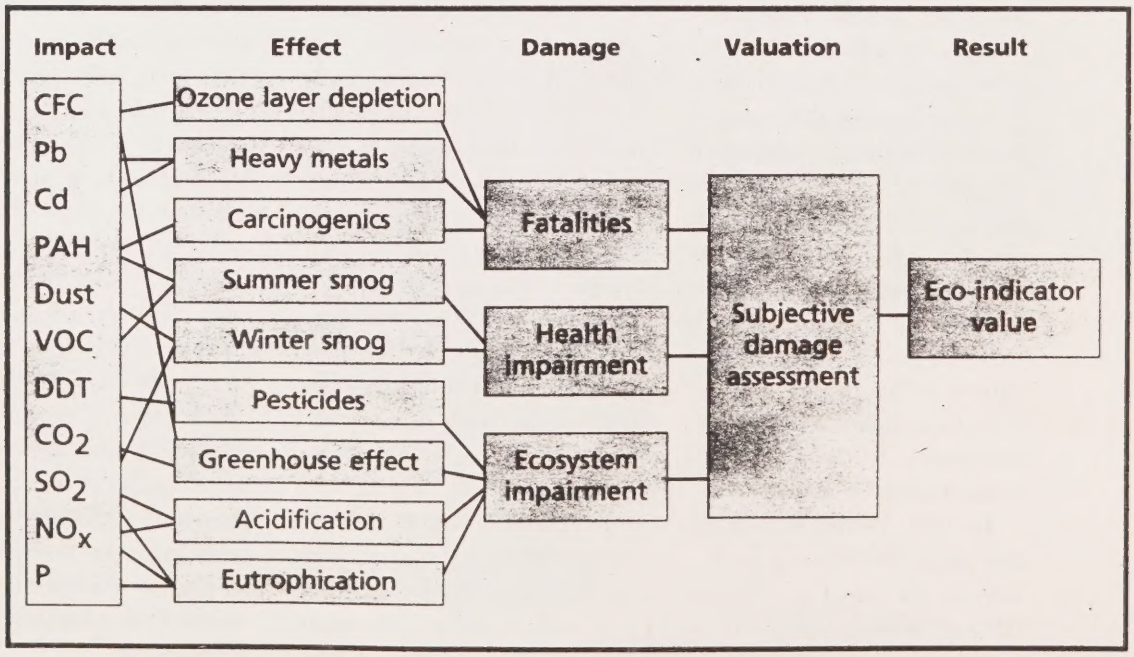
To calculate the eco-indicators, the team:

- established the life-cycle inventory numbers (100 LCAs - some new, others revised from existing LCAs);
- classified the inventory numbers into the environmental effects;
- related (i.e. normalized) the numbers to the environmental effects that an average European causes in a year; and
- recalculated the number based on a weighting system.

The process for the weighting system is shown graphically below. While the weighting system is subjective, it is based on a number of assumptions that were established through consultations with experts and comparisons to other weighting methods.

This method gives designers a better picture of where the potential environmental impacts of the product are and, therefore, where to target design improvement.

The original project participants for Eco-indicator 95 included Nederlandse Philips BV, Océ Nederland BV, Netherlands Car BV, Machinefabriek Fred A. Schuurink BV, the Universities of Lieden, Amsterdam and Delft, the TNO Product Centre, the Centre for Energy Conservation and Environmental Technology Delft



and the Dutch Ministry of Housing, Spatial Planning and the Environment.

The project has now expanded beyond the Netherlands to include other European partners, and Eco-indicator 97 is expected to be released in December 1997. The 1997 version will include more indicators and will go beyond emissions to address resource depletion issues.

For more information contact:
PRé Consultants
Tel: +31 (0)33 4555022
E-mail: pre@sara.nl

Applying Eco-indicators A 5 Step Process

1. Establish the purpose of the eco-indicator calculation. (Describe the product. Is it product improvement or a comparison with another product? What level of accuracy is required?)
2. Define the life cycle. (Draw a life-cycle map [process tree] including production use and waste processing stages).
3. Quantify material and processes. (Determine the functional unit. Quantify all relevant processes in the life-cycle map.)
4. Fill in the form provided (see right). (Note materials and processes by weight, enter the eco-indicator values and multiply the weight by the eco-indicator value to get the score.)
5. Interpret the results. (Combine conclusions with results, check assumptions, amend results if necessary and see if the purpose of the study has been met.)

Product or component	Project
coffee machine	example
Date	**Author**
17-07-95	PRé

Notes and conclusions
Analysis of a coffee machine, assumption: 5 years' use, 2 x per day, half capacity, keep hot for 30 minutes.

Production

Materials, treatments, transport and extra energy

material or process	amount	indicator	result
polystyrene	1 kg	8.3	8.3
injection moulding PS	1 kg	0.53	0.53
aluminum	0.1 kg	18	1.8
extrusion Al	0.1 kg	2	0.2
sheet steel	0.3 kg	4.3	1.29
glass	0.4	2.1	0.84
gas-fired heat (moulding)	4MJ	0.063	0.252
Total			13.2

Use

Transport, energy and possible auxiliary materials

material or process	amount	indicator	result
electricity low-voltage	375kWh	0.67	251
paper	7.3 kg	3.3	24
Total			275

Disposal

Disposal processes for each material type

material & type of processing	amount	indicator	result
municipal waste, plastic	1 kg	0.69	0.69
municipal waste, ferrous	0.1 kg	1.2	0.12
municipal waste, ferrous	0.3 kg	1.2	0.36
household waste, glass	0.4 kg	-0.8	-0.32
municipal waste, paper	7.3 kg	0.33	2.4
Total			3.25
Total (all phases)			291.5

sustainable product development

The UNEP-WG-SPD defines sustainable product development (SPD) as going beyond the environmental optimization of products and the ideas of eco-design and design for environment, to consider the service and function of the product, and the related social benefits versus the impact on sustainability. In other words, SPD asks, "Is the product really needed?"

The United Nations Environment Programme Working Group on Sustainable Product Development (UNEP-WG-SPD) was formed a few years ago in response to the Agenda 21 call for changes in production and consumption patterns. Their activities fall into two categories: research and networking.

Research

The Research Programme consists of 3 branches of work:

1. Monitoring the state of the art in SPD;
2. Database of SPD examples; and
3. Theoretical research into the future potential and development of SPD.

Products and services for everyday human needs are the focus of the research. This includes needs for transportation, communication, heating, cooling, clothing, and water use. Much of the work considers the needs of developing countries. Design approaches support these needs and consider issues such as longevity, renewable resources and renewable energy.

Research focuses on everyday human needs

Networking

The Network Programme aims to build an international network of contacts to promote SPD and stimulate co-operation and information exchange. Membership in the UNEP-WG-SPD International Network is free of charge. The network includes over 600 organizations in 46 countries around the world.

Dutch Centre studies SPD

Since the opening of a centre for sustainable product development at the University of Amsterdam, staff have been busy implementing the centre's mission which is to explore, develop and implement SPD worldwide and to stimulate and develop SPD research around the world.

Activities of the centre include presenting at international conferences, holding workshops and seminars, producing information documents, and engaging in joint projects focusing on SPD. One such project is an eco-operation project with the National University of Benin in West Africa that is looking at leaves used for packaging.

To improve knowledge and dissemination of knowledge on sustainable product development,

join the discussion on sustainable products

A new international database is now available on the Internet courtesy of the United Nations Environment Programme - Working Group on Sustainable Product Development (UNEP-WG-SPD). Everyone is invited to view the sample products and join the discussion about sustainable product development (SPD).

The products, which include bamboo bicycles, clockwork radios, solar cookers, Xerox ecoserie copiers, fog catchers and more, come from around the world and are updated and expanded regularly. The UNEP-WG-SPD encourages debate on these 'live' examples to further develop, improve and promote the concepts and ideas of SPD. Short abstracts and up to six illustrations are provided for each product.

The database is located at http://unep.frw.uva.nl/ under the heading "Product Examples Database." To join the discussion list, send an e-mail to listserv@nic.surfnet.nl and state in the body of the e-mail: subscribe spdex-l *your name*

For more information contact:
Han Hegeman, Msc
UNEP-WG-SPD
Tel: +31 20 525 6264
Fax: +31 20 625 8843
E-mail:
hegeman@unep.frw.uva.nl

groups of 'theme' experts from industry, research, NGOs, and policy areas, are being formed around selected needs and design approaches.

The UNEP-WG-SPD plans to form Expert Groups for each theme in the areas of human needs and SPD approaches. These groups will provide first hand advice and research support for anyone interested in SPD. To date, an Expert Group on Renewable Materials has been formed and two others, Service Design and Communication, have been initiated.

Within the Expert Groups, research focuses on building expertise within developing countries so that UNEP-WG-SPD can function as the international centre for the exchange of best practice between developed, transitional and developing countries on the subject of sustainable product, systems, and services.

For more information contact:
UNEP-WG-SPD
3rd Floor, J.H. van't Hoff Institute, Building B.
Nieuwe Achtergracht 166,
1018 WV
Amsterdam, The Netherlands
Tel: +31-20-5256268
Fax: +31-20-6258843
E-mail:
unep@unep.frw.uva.nl

NEW JOURNALS PREMIERING IN SPRING '97

Industrial Ecology

The Journal of Industrial Ecology is an international, multi-disciplinary quarterly on industrial ecology. Owned and edited by Yale University and published by the MIT Press, the journal encourages interdisciplinary submissions and provides a forum for continuing an exchange of information and opinions.

Topics covered include:

- material and energy flows studies (industrial metabolism);
- technological change;
- dematerialization and decarbonization;
- life-cycle planning;
- design and assessment;
- design for the environment;
- extended producer responsibility (product stewardship);
- eco-industrial park (industrial symbiosis);
- product-oriented environmental policy; and
- eco-efficiency.

For more information,
consult the journal's web site at:
http://www-mitpress.mit.edu/jrnls-catalog/jie.html
or contact:
The MIT Press Journals
55 Hayward St., Cambridge, MA 02142 USA
Tel: 1-617-253-2889
fax: 1-617-577-1545
E-mail: journals-info@mit.edu

Sustainable Product Design

The journal of Sustainable Product Design is a quarterly publication discussing the economic, environmental, ethical and social issues of product design and development. It aims to balance practical issues as they affect us today with the exploration of new ideas and thinking.

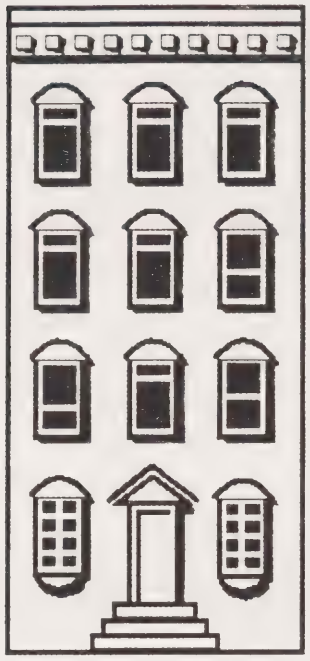
The journal will provide objective analysis with articles from leading thinkers and practitioners around the world.

Contents will include case histories, interviews, research and surveys, innovation ideas, examples and images of sustainable product design, reviews, and an events calendar.

For those who prefer electronic access, a unique feature of this journal is that it will be downloadable from the Internet via a password.

The Centre for Sustainable Development is co-ordinating and editing the Journal, with the support of an international editorial board.

For more information contact:
Martin Charter
The Centre for Sustainable Design, UK
Tel: +441252-732229
Fax: +441252-732274
E-mail: cfsd@surrart.ac.uk
Web site: http://www.cfsd.org.uk



new guidelines for LCAs on buildings

Canada is leading the development of international guidelines to determine the energy-related environmental impacts of buildings. The task group, known as Annex 31 of the International Energy Agency, includes eminent researchers from seven European countries as well as the United States, Japan, Australia and New Zealand.

Canada leads the development process.

Annex 31 will publish a guideline that can be used by anyone trying to create new methods, tools or benchmarks for rating the environmental impacts of a building. In the past, the environmental assessments of houses, offices and buildings have looked at energy needs for heating, lighting and operating mechanical systems. The new Annex 31 guideline will take a broader perspective and include:

1. energy consumption over the full life cycle of the building (including extraction of resources, transportation, fabrication, construction, renovation, demolition and disposal);
2. full fuel cycles (the energy chains used to create, process and distribute fuel used in a building); and
3. essential infrastructure (for example, the energy used to create and operate water reservoirs, sewage treatment plans, roads, gas pipes, etc.).

While the final guideline will help harmonize and improve research within participating countries, there are a number of interesting research studies now being undertaken as part of the process . These studies include an annotated list of reports and pub-

Sweden's centre of excellence

The Centre for Environmental Assessment of Product and Material Systems (CPM) in Sweden is a centre of excellence with a ten-year mandate to develop knowledge relevant to Swedish industry in the field of sustainable product development. The Centre is a joint venture between an industry group representing ten leading Swedish industries, Chalmers University of Technology and the Swedish National Board for Industrial and Technical Development. Funding for the first 2 years is approximately $3.8 million (CAN).

The overall goals of the CPM are to :

- **prevent and decrease environmental impacts of products;**
- **gather and reinforce Swedish competence in sustainable product development at an international level; and**
- **provide industry and society with relevant methods and support for integrating environmental aspects into decisions regarding products and materials.**

The CPM organizes research on life-cycle assessment and other

lications, an international survey of existing methods, benchmarks and tools for assessing buildings, an evaluation of database design and data requirements, and other reports.

Work of the Annex 31 task group will be featured at the 1998 Green Building Challenge in Vancouver.

For more information contact:
Canadian Representative
Sebastian Moffatt
Tel: 1-604-732-9106
Fax: 1-604-732-9238
E-mail: smoffatt@istar.ca

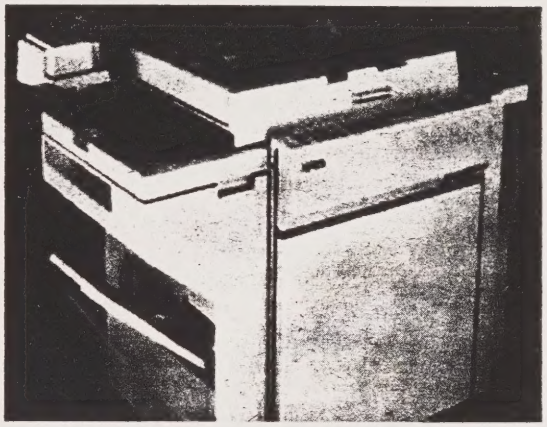
or

Annex 31 Chairperson
Peter Russell,
Canada Mortgage & Housing Corporation
Tel: 1-613-748-2306
Fax: 1-613-748-2402
E-mail:
prussell@cmhc.email.com

http://annex31.tce.rmit.edu.au/iea/home.htm

related tools, develops competency in sustainable product development through its graduate program, maintains databases for LCA and develops and adapts LCA tools (software, design guides, databases) for Swedish industry. The CPM will ensure the transfer of knowledge to industry through staff exchanges, information seminars, publications and by handing over the data and any tools that are developed. An important aspect of this transfer of knowledge is the employment of the graduate students in industry.

Xerox CEO says environmental initiatives save $



Not only did Xerox Canada win the Financial Post 1996 Product Stewardship Award, but according to the Corporate Chairman and CEO of Xerox, Paul Allaire, "Xerox's environmental initiatives have already saved hundreds of millions of dollars, helping support the notion that what is good for the environment is also good for business."

Xerox's product stewardship program, known as Factory Processed Manufacturing, takes a life-cycle management approach and includes design for the environment, environmentally responsible manufacturing and a comprehensive material return program.

At Xerox, the design stage is key to minimizing manufacturing and product emissions and keeping materials out of the waste stream. Equipment components are designed for many life-cycles as well as easy disassembly.

Spent products are completely disassembled, tested and where possible, the parts and components are brought back to original equipment specifications. These parts and components are then manufactured in a full scale ISO 9002 process to ensure quality, performance and durability.

Since many Xerox products are designed for reuse it's important, from both an environmental and business point of view, that they are returned to Xerox. That's why Xerox launched a mail-back program with Canada Post that encourages customers to return used parts and supplies through the mail at no cost.

Xerox Canada is the first company to get the Canadian Environmental Choice EcoLogo™ for photocopiers, fax machines and printers and 29 products have been licensed to date. Future products are being designed to be eligible for the EcoLogo™

For more information contact:
Tom Armstrong
Xerox Canada, Ltd.
Tel: 1-416 733-6994
Fax: 1-416 733-6402
E-mail:
Tom_Armstrong@torho.xc.xerox.com

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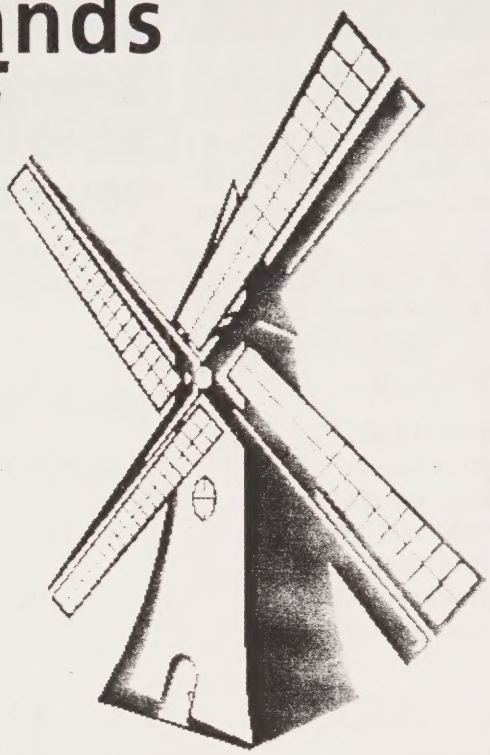
PROMISE



The development of environmentally-oriented products can bring about "substantial environmental improvements in products as well as producing economic benefits." These are some of the results from demonstration projects undertaken by *PROMISE* — which is a Dutch acronym for Product Development with the Environment as an Innovation Strategy.

This program is part of the implementation strategy for the Dutch Policy on Products and the Environment. The aim of the policy is "to bring about a situation whereby all market actors – producers, traders and consumers – are involved in an ongoing effort to reduce the impact which products have on the environment."

PROMISE includes eight demonstration projects of environmental product development, a design manual, brochures, an overview of obstacles and possible solutions, a video and a study of the possibilities for stimulating environmentally-oriented product development (EPD) via government policy.

The *PROMISE* manual offers a clear strategy for implementing EPD in company operations. It assists product manufacturers and designers to create a MET matrix (material cycle, energy use and toxic emission matrix) which highlights a product's environmental problems and benefits. This information allows the company to explore strategies which will improve the product design. These strategies include looking for product alternatives, material substitution, or reduction in raw materials, closing material cycles, energy saving reductions and more efficient distribution and logistics.

PROMISE provides opportunities for cost reduction through reduced energy and material costs and revenue generation through the development of innovative "green" products. These products can improve the image of the company and increase market potential and positioning of the products in relation to international competitors.

A major obstacle to implementing EPD is the lack of innovative capacity and vision within industry. There is also a lack of information, tools and practical experience. The *PROMISE* manual addresses these obstacles by providing a strategic vision of EPD and its relation to environmental policy. It also provides practical examples of cost/benefit analysis, implementation methods and alternatives to dealing with information gaps.

Other programs associated with the Dutch product policy include:

- general information campaigns on environmentally-oriented product development;
- eco-design advisory services to companies through established innovation centres;
- financial credit programs which will help lower the threshold for environmentally-oriented product development;
- a "new approaches" programme to assist companies in moving from products to services; and
- financial support to companies to apply process-based environmental management systems to the products they make.

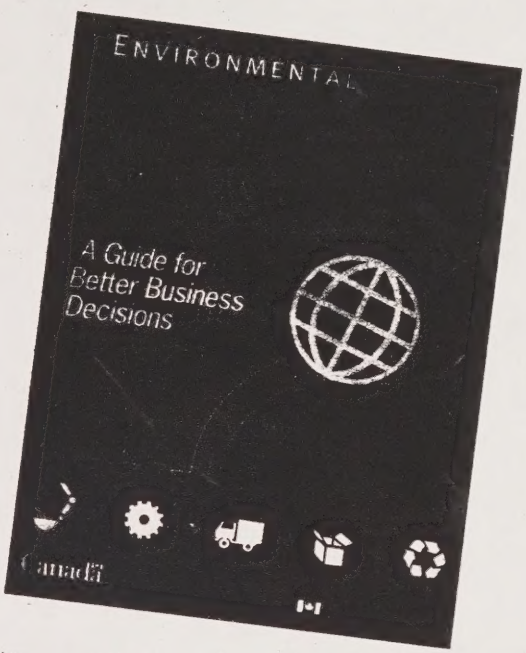
Work also includes research into implementing integrated life-cycle management within companies, the role of the retail sector and consumers, environmental labelling and database development.

new guide makes for better decisions

The National Office of Pollution Prevention and the Hazardous Waste Branch of Environment Canada are publishing a new guide designed to assist small- and medium-sized businesses apply environmental life-cycle thinking to their operations.

Environmental Life-cycle Management: A guide for better business decisions gives an overview of life-cycle management (LCM) and its associated business advantages. It offers a framework for LCM with examples of how to apply it in 5 different job functions. The guide also suggests steps for integrating LCM in all levels of an organization and provides a tool kit to assist in the understanding and application of LCM.

The guide will be available on paper in April 1997 and on the Ecocycle internet web site by May 1997.



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For more information, or to send abstracts (about 200 words), please contact, Andrew Spicer or Andie Paynter by May 30th, 1997.

Andrew Spicer,
IJECDM Regional Editor for Canada
Tel: 1-416-921-8592,
E-mail: ajs@interlog.com

Andie Paynter,
Environment Canada
(see Publisher's Message for contact information)

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